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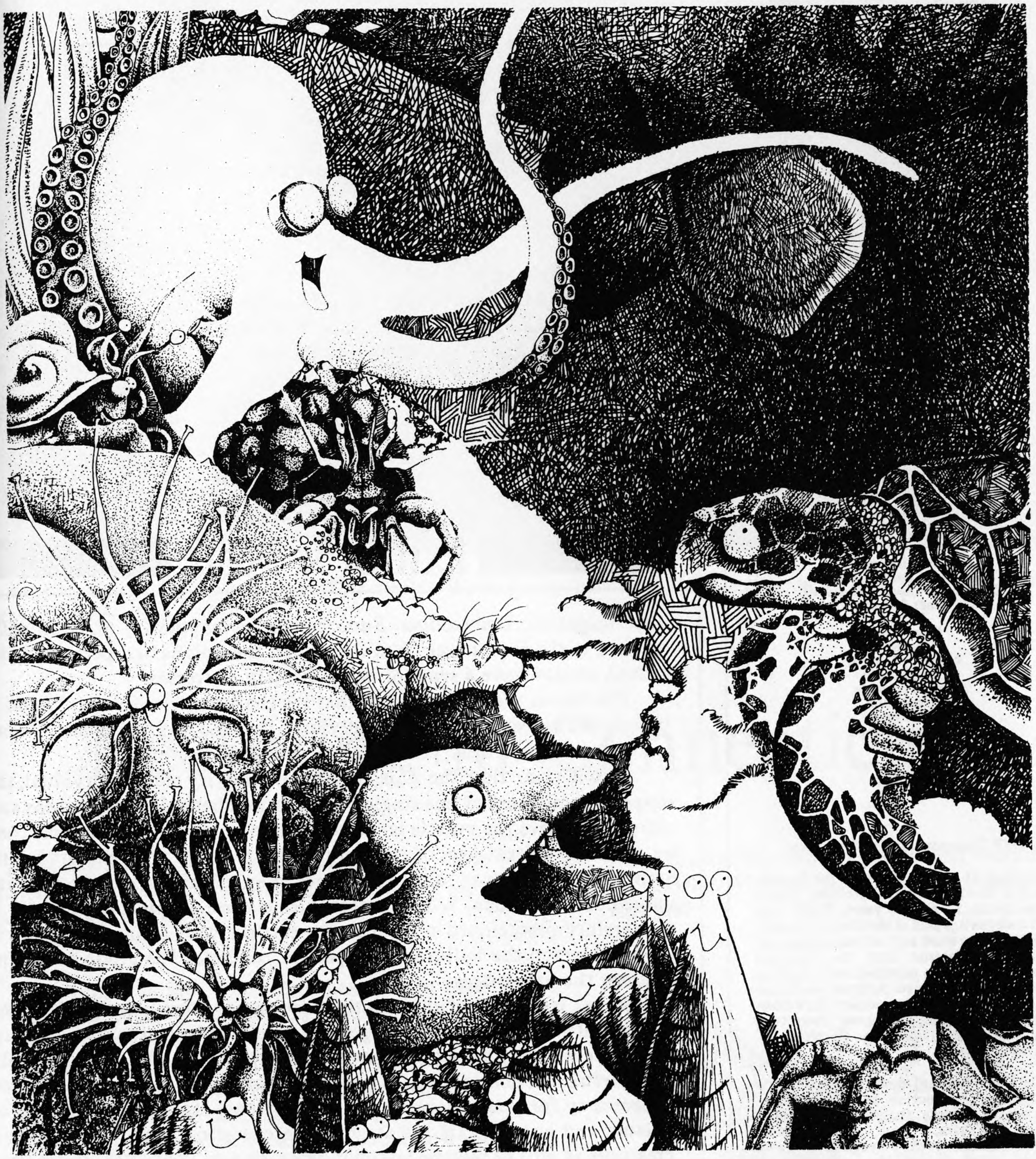

Beneath the Sea February/1990

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Cover "Beneath the Sea" by Chris Rowlands

Commissioner
Leslie Carothers
Director of Communications
Wanda Rickerby
Editor
Robert Paier
Graphics
Rosemary Gutbrod
Composition
Caryn Furbush
Circulation
Olive Tyghter
Business Manager
Donna Fadoir

Phone
566-5599

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Editor's Note

This magazine, *Connecticut Environment*, is explicitly, unashamedly, written to the individual. You, the reader, the unique and personal individual, should have a sense of being directly addressed.

The reason we do that is not that it's charming and folksy. We do it because we know it is with the individual that the real power lies. "What can I, one single, lonely person do?" Answer: Everything.

Isn't it clear that the pure, undiluted integrity of one individual, the simple commitment of one single person to do what's right and decent and correct, is where the muscle is? Once a group or organization forms, then by necessity a great part of its energy gets taken up with preserving its own identity, its own skin. Sometimes even all of the energy is so involved. An individual who operates with a sense of mission generally is not terribly preoccupied with his own earthly well-being. The group is vague, abstract; the individual is specific, concrete. The group considers, ponders; the group does.

So, yes, it is wonderful when there are groups, committees, task forces, all dedicated to great and noble goals. And if you belong to such a group, if you are working with others to make this world better, that is certainly wonderful. But don't think for a minute that that group, that task force, is necessary for you to do your job. If this planet is to return to a level of balance and harmony, if we are to begin operating with respect for all creatures, it will be because *you* do it. Operating on your own, under your own power. That's the *only* way it can be done.

That's why this magazine is addressed to you. R.P.

"We need to start doing some things differently. We're going to have to think a little more and form new habits." *(Photos: R. Paier)*

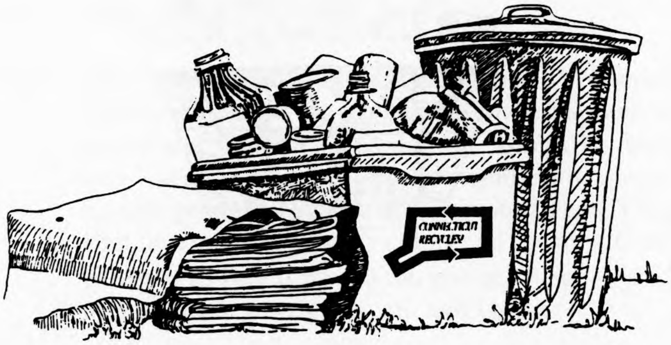
Recycling in Connecticut

(The following interview was originally aired on public access television stations thoughout Connecticut as part of the series Environment.)

CE: Recycling is an idea whose time has come in Connecticut. Governor O'Neill has signed into law a bill mandating that 25 percent of Connecticut's waste stream be recycled by 1991. So, if you live in Connecticut and you haven't heard about recycling yet, you can be sure that you will in the very near future. With us to talk about recycling and what it will mean to every one of us is Kim Marcy. Thanks so much for coming today, Kim.

KM: Thank you for inviting me.

CE: Kim, you are the recycling education coordinator for the DEP. What are the duties that go along with that job?



KM: I do a lot of public outreach. I speak at Rotary Clubs, the Sierra Club, town meetings, and public works meetings. We also produce support materials for towns around the state. We've got an introductory video that has been aired on public TV. We have public service announcements for television and radio, and a recycling primer.

CE: This is a fundamental question but I suspect one that a lot of people would like to ask. For as long as I can remember, I've taken the trash out every week. I've left it in front of the house. I go away. Then, when I come back, it's gone. I like that system. What's the problem?

KM: The problem is that it's been too easy for years and years. We're all in the habit of not thinking about what we're doing. We throw everything away when, in fact, a lot of things we're throwing out can be made over into useful products again. In essence, we're wasting natural resources and energy.

CE: Isn't it true that we are also running out of landfill space?

KM: Yes. There are 74 landfills that are permanent. In Connecticut right now, over 40 of them are at capacity or near it.

CE: Why not build more landfills?

KM: There have been a lot of environmental problems with the landfills, problems that people didn't know about when they began building sanitary landfills. There is a problem with leachate -- the water that goes down through a landfill, like water going through coffee grounds. When rainwater goes through a landfill, it comes out as leachate -- which is a substance that contains heavy metals and whatever else may be in the landfill. That leachate then seeps into water systems and contaminates ground water.

"We're reaching crisis proportions at the landfills as far as environmental impact on rivers and surrounding groundwater is concerned."

CE: Is that only theoretical or has it already happened?

KM: It's actual. We have 76 wells in Connecticut that have been contaminated by leachate to the point where people can no longer drink the water.

CE: How much solid waste are we producing here in Connecticut?

KM: The average at this point is five pounds per person per day. If you like larger numbers better, 2.7 million tons per year.

CE: We know how much waste we are producing. We know how much landfill space is available. What happens when you put those figures together?

KM: We're in trouble, that's what happens. We need to start doing some things differently. It's no longer going to be quite as easy to just put trash out and forget about it. We're going to have to think about it a little more and form a few new habits.

CE: What if we don't do anything? What if we just let the trash be taken away and not worry about it?

KM: That's not an option any longer because recycling is now the law. There will be penalties if you don't participate.

CE: Some people have seen this coming for some time. Why now has a law gone into effect to respond to it?

KM: We're really reaching crisis proportions at the landfills as far as environmental impact on rivers and surrounding ground water is concerned. Also, landfills are filling up and nobody wants new ones established their back yard. Siting new landfills is a big problem.

CE: We have a problem. We are in trouble. What specifically is the state's plan to respond to it?

KM: The plan to handle the waste in the next 20 years contains four major points. The first point is *source reduction*, reducing the amount of waste generated at home. This can be done by buying things in bulk to reduce the amount of packaging and buying products that are not over-packaged. In essence, become wiser consumers. The second point is *recycling*. The nine items on the list will no longer be accepted at waste facilities. The third point is *waste-to-energy facilities, or resource recovery facilities*. Basically, these facilities burn trash to generate steam to make electricity. The fourth point is *landfilling*. We are still going to need landfills even when we are doing source reduction, recycling, and resource recovery because we'll have 10 to 20 percent of the waste stream left.

CE: That's the plan. Is it in the implementation stage?

KM: Yes, we are in the process of implementing the recycling program. We have a demonstration region.

CE: The governor says 25 percent by 1991. Can it be done?

KM: It can be done. The formation of the regions has been slower than we expected for siting the intermediate processing centers. At this point we still think the goal can be achieved.

"Recycling is more than separating cans and bottles. It's taking care of our environment."

CE: Could you describe what goes on at typical landfill in Connecticut?

KM: Every day, after the trucks make their pick-ups, they dump the garbage at the landfill. They cover it with six inches of dirt at the end of the day and they roll over it with compacters and bulldozers to compact it as much as possible. The dirt serves to keep rodents and the like down as much as possible. The problems in Connecticut are primarily environmental impact problems. As of September of last year, 76 wells and 40 rivers have been contaminated. These numbers could go up at any time. We know that 60 out of 74 landfills are causing environmental problems. A few of the things that get picked up by leachate are ammonia nitrate, iron, lead, copper, manganese, methane, chloride, sodium, and some dioxide. We never really know what's in leachate -- it varies from landfill to landfill -- simply because we don't know what's in the landfill.

CE: What is an IPC?

KM: The Intermediate Processing Center. It's a small factory for handling recyclable products such as metal and glass food containers. Basically, they take these items and process them into a marketable product. Glass cullet is crushed glass. They first separate the glass by colors and crush it. Companies will buy it by the ton and use it when they manufacture new glass jars and bottles.

CE: How many IPCs are there in Connecticut?

KM: Right now, there is only one, in Groton. They are thinking of building seven or eight more as the regions form and as they get more IPCs sited. IPCs are definitely a very important instrument in the recycling process.

CE: We keep talking about the southeast region as a success. Why is that?

KM: Because they were the first to start. The first IPC is there to be used. It doesn't do people any good to get them all excited about recycling if they don't have the facilities. Consequently, most of our educational efforts have been centered in this area.

CE: So fundamentally, you've accomplished the mission in the southeast region.

KM: Yes, it's not all the way there, but it's well on the way. They've just upgraded the IPC in Groton to handle 40 tons per day instead of 20 tons per day. Also, we have recently added another demonstration region in the Bridgeport area in southwestern Connecticut. The second IPC will be in operation 1990. Also, the northeastern and northwestern regions of the state will be shipping recyclables direct to market and will not have IPCs.

CE: As you go around the state of Connecticut, what kind of response do you get when you tell people that they are going to have to change their lifestyles? Do you see resentment or a spirit of cooperation?

KM: Surprisingly, the majority by far are very supportive. Many people want to know what they can do now. They really want to get into it and become active. Everybody has a vested interest in Connecticut remaining a beautiful state.

CE: Suppose I'm someone who has found out about recycling for the first time right now. I'm concerned about it. I want to do the right thing. What can I do?

KM: You can start by putting up a list of the exact items that need to be recycled by 1991. Just knowing what those items are will make a difference in the way you handle trash. It makes you mentally ready to sort them even if your town is not yet doing so. Those items are: glass food containers, metal food containers, cardboard, newspaper, and office paper or white paper. Scrap metal, car batteries, used motor oil, and leaves will all have to be recycled by 1991. Up to 10 percent of the waste stream is leaves. They may be handled at municipal compost centers. I'd like to mention that business will not be excluded from this bill. That's something that a lot of people don't understand.

CE: Now suppose I live in a town that has not yet geared up to recycle and I want to do something to help this effort. Can you give me any idea what I would do?

KM: The source reduction aspect that I talked about is something that everybody can do continuously. It doesn't require an IPC. It's simply to start thinking about what you bring into your home in terms of what you will leave in a trash can. It's things like buying items in bulk -- flour, sugar, grain, pasta. It will save you money and packaging. We've become very convenience oriented. We'll be giving up a little of that. Another thing you can do is purchase durable instead of disposable goods. Things like pens and razors can be bought in refillable forms. All these seem like little things but it does have an impact if everyone starts changing their buying habits. Another thing is to avoid over-packaged products. An example I use is a box of deodorant. The whole product is encased in a plastic tube and completely protected. The cardboard box doesn't do anything as far as helping the product. All it does is sell it to you. That's over-packaging. It all costs money. You pay for the extra packaging, the advertising, and to have trash hauled away. Along the same lines we can buy products which are packed in biodegradable material using paper and cardboard instead of styrofoam and shrink wrap. You can look for the recycling label. These plastics take hundreds of years to degrade. Its always better to use paper bags instead of plastic bags at the grocery store. This sort of thing.

CE: Finally, it seems that what the individual does means a lot in the big picture?

KM: That's one of the main points I stress. What every person does matters. The program will succeed or fail depending on what the average person does. We all generate trash, it's all of our problem. Connecticut's a beautiful state. Recycling is going to help keep it that way. ■

CONNECTICUT
RECYCLES!

The Natural Historian

A Bluebird in Every Meadow

by
Carol Davidge
Public Information Coordinator
Connecticut State Museum
of Natural History
The University of Connecticut

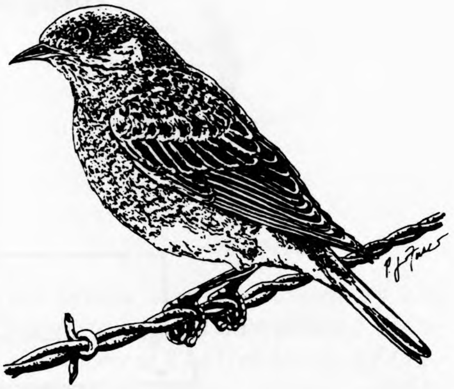
LATE FEBRUARY is the ideal time to put up new bluebird houses or clean out existing ones. Most Eastern bluebirds will arrive in Connecticut the last week of February and begin to scout for nesting sites. Boxes may be installed any time of the year, but since bluebirds mate in March and begin families in April, putting up houses in February gives the best opportunity to attract bluebirds throughout the breeding season (April through Labor Day).

Although it is one of America's most beloved songbirds, the Eastern bluebird has very specific needs, requiring that nest boxes be constructed to exact dimensions and located so the birds are safe from predators such as raccoons and snakes and competitors like the starling and house sparrow, both non-native species.

In addition, ornithologist David O. Hill of Guilford urges that for each bluebird house you put up, you also commit a few minutes per week from April through August to monitoring it.

"Wildlife management for bluebirds is essentially keeping the box empty except for bluebirds," he said. This means checking the boxes and removing nests of house sparrows and starlings. Destroying the nests of starlings and house sparrows is legal and must be done if bluebirds are to use the boxes. A third competitor, the house wren, need not be a threat if a smaller box is provided for it. Occasionally other desirable native species, such as chickadees and tree swallows may inhabit bluebird boxes, which indicates the need for additional boxes. "Putting up bluebird boxes without proper management creates more of a problem than a solution. It actually provides homes for the enemies of bluebirds," said Hill.

For those willing to learn the intricacies of proper wildlife management for bluebirds, the rewards are great.



"They are the quintessential American bird. Native to North America, they are red, white and blue; they have no negative qualities; they just sing beautiful songs, and fill the earth with beauty," said Hill. Henry David Thoreau wrote in his journal that bluebirds carry the sky on their backs. Judy Garland sang that "Somewhere over the rainbow, bluebirds fly," and we sometimes sing about "the bluebird of happiness."

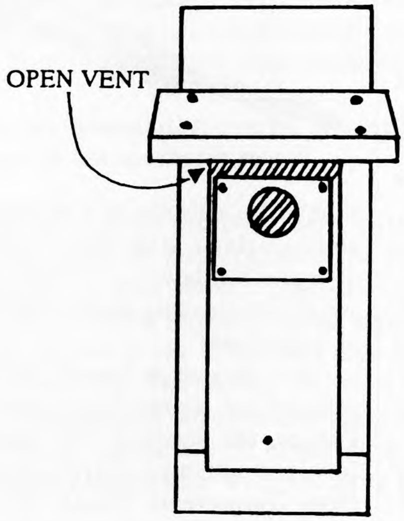
But because of loss of habitat and competition from immigrants from Europe, the starling and house sparrow, the bluebird nearly disappeared from Connecticut. Thanks to individuals such as Hill, who travels 70 miles round-trip each week from April through Labor Day to maintain his 129 bluebird boxes, the bluebird is slowly returning.

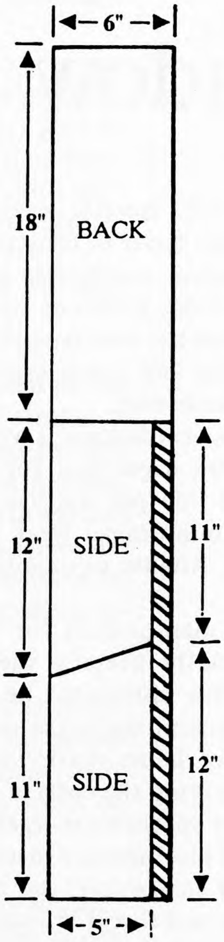
Hill is one of seven members of the volunteer Bluebird Working Group that assists the DEP in its bluebird program. Other members are: Julie Victoria of DEP's Sessions Woods Wildlife Management Area, Burlington; Rob Braunfield, Hadlyme; Mark Clifton, Killingworth; Fred Comstock, Bethlehem; Arthur Gingert, West Cornwall; and Dave Rosgen, Litchfield. The group is constantly discovering new things about the needs of the Eastern bluebird, which is why people who are interested in bluebirds need to stay in communication.

For example, Hill, who has 38 years of worldwide experience as an ornithologist, says he's learned a lot in the seven years since he first put up bluebird next boxes. "I put up 50 boxes in prime bluebird habitat -- fields, meadows, old orchards -- and had no bluebirds at the end of the first season," he recalled.

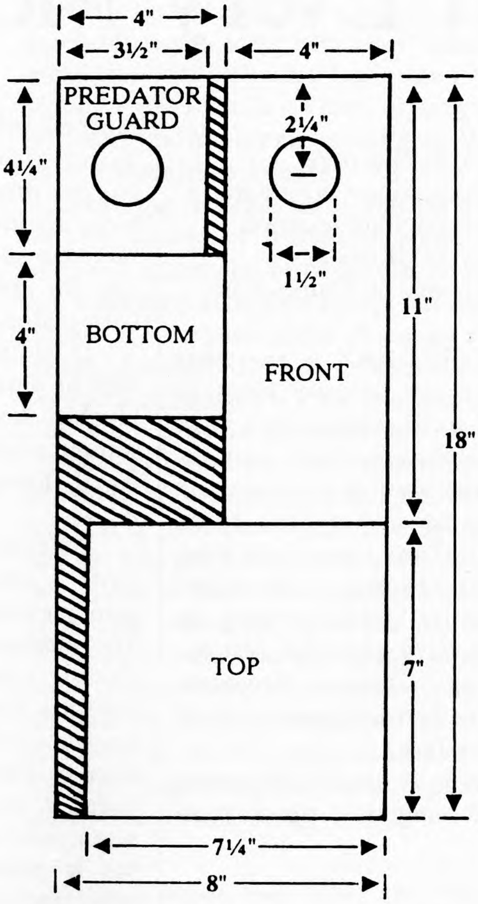
Bluebird Nest Box

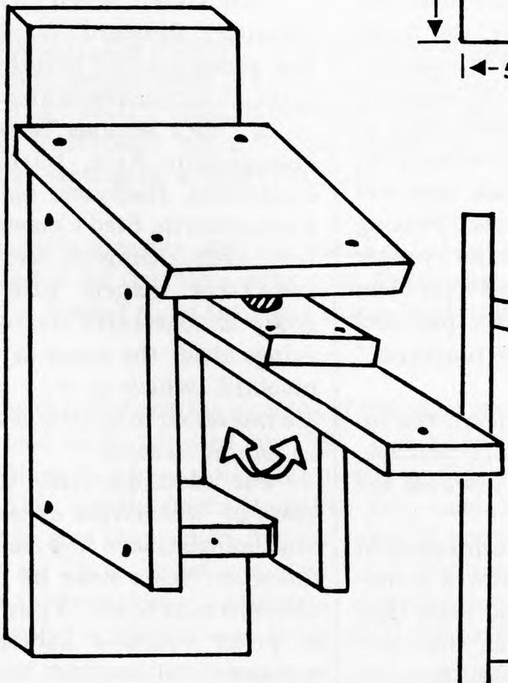
(Designed by the Connecticut Bluebird Working Group)

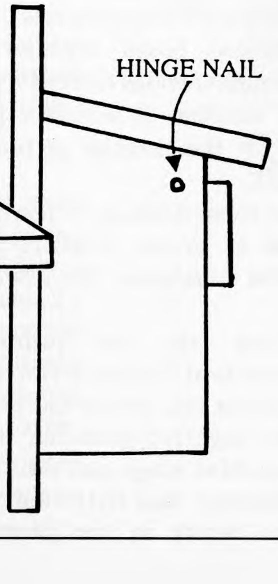


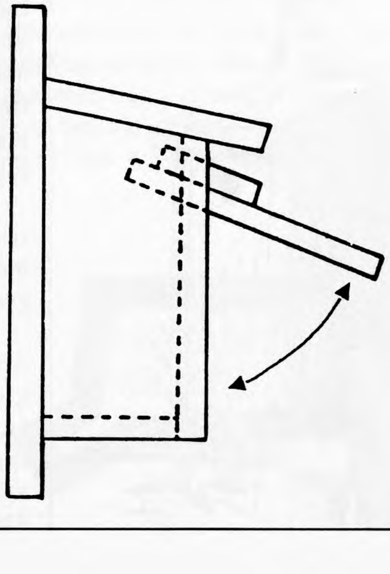


All boards are 1-inch thick.









He discovered that the starlings and house sparrows had so driven the bluebirds from their traditional habitats around Guilford that nest boxes had to be placed in "edge" habitats, near woods, where he found that bluebirds had survived. After a time, they became accustomed to the nest boxes and could be lured to re-enter the fields, orchards, and meadows where their food supplies enabled them to thrive.

"My objective is to see a bluebird in every meadow," Hill said, adding that throughout Connecticut there are still numerous fields, golf courses, and meadows that make prime habitats for bluebirds if competitors and predators can be thwarted.

BRIEFLY, SOME CRITICAL details must be part of a successful bluebird nest box program:

1) One side or the front of the box must be movable so the nests can be cleaned out.

2) The entry hole must measure *exactly* 1-1/2 inches.

3) The inside bottom floor should measure four by four inches and be located at least six inches below the entrance to keep predators from reaching eggs;

4) To create a raccoon guard, make the depth of the entrance hole 1-3/4 inches by adding a second piece of wood.

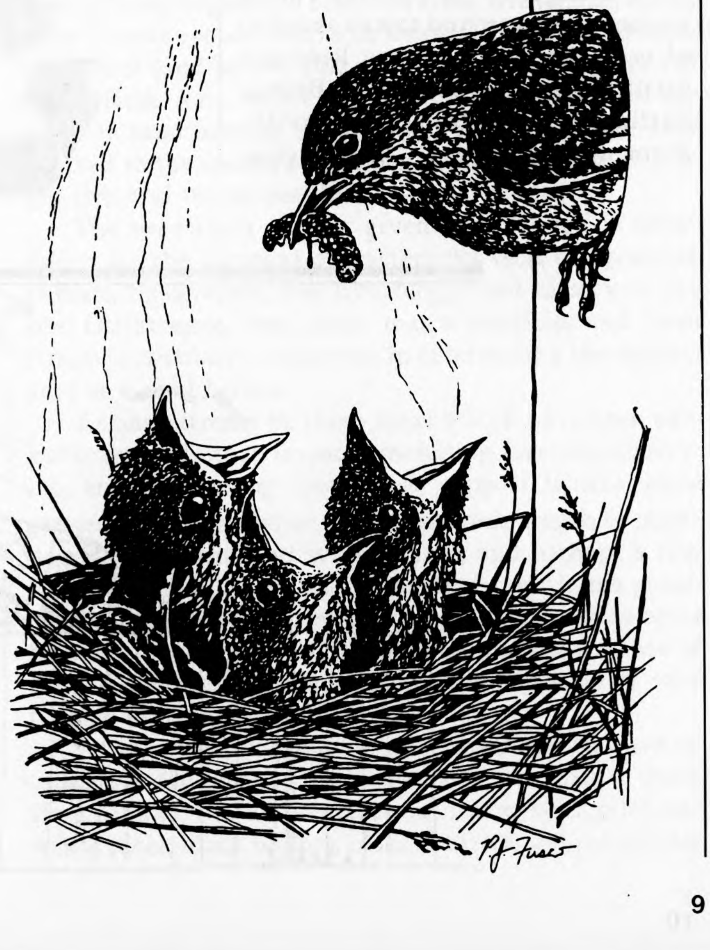
5) The box must be watertight to keep out the rain.

6) The box should be located on a post -- not a tree -- three to five feet above ground, desirably 40 feet or more away from trees and bushes to prevent a house wren problem.

For further information about the bluebird, please see the April, 1989, issue of *Connecticut Environment*. That information, together with fact sheets with complete dimensions for nest boxes and data about habitat and winter feeding, are available from the DEP Wildlife Division, the Connecticut State Museum of Natural History at UConn, and the North American Bluebird Society. The DEP Wildlife Division, the Museum, and many nature centers offer workshops about constructing and maintaining bluebird nest boxes. On February 11 at 3 p.m. in Jorgensen Auditorium at UConn, David Hill will present a slide talk about wildlife management for bluebirds. Also, in February, the Museum will offer a bluebird house building workshop for families.

Further information may be obtained from: DEP Wildlife Division, Nonharvested Wildlife Program, Sessions Woods Wildlife Management Area, P.O. Box 1238, Burlington, CT 06013 (203) 584-9830; The Connecticut State Museum of Natural History at UConn, Box U-23, Storrs, CT 06269-3023 (203) 486-4460; or the North American Bluebird Society, P.O. Box 6295, Silver Springs, MD 20906-0295 (301) 384-2798.

This article was contributed by The Connecticut State Museum of Natural History at The University of Connecticut in Storrs, which exhibits mounted birds of Connecticut, the largest mounted white shark on display in the eastern United States, "Videoplace" interactive video, Indian artifacts, and offers programs for teachers, children, and adults. For information, contact the Museum, UConn Box U-23, Storrs, CT 06269-3023; phone (203) 486-4460. ■



New Recycling Programs

RECYCLING PROGRAMS in 20 Connecticut towns got a boost with the official signing of two planning contracts totalling nearly $100,000 in grants from the Connecticut DEP.

The Connecticut River Estuary Regional Planning Agency and a new "Tunxis Recycling Region" will plan comprehensive regional recycling programs which, together, will serve an estimated 304,000 Connecticut citizens, enabling them to meet the requirements of the state's Mandatory Recycling Act.

"This is an important moment for Connecticut's recycling movement," said DEP Commissioner Leslie Carothers. "It adds one tenth of our state's population to the large numbers of citizens already recycling all over Connecticut."

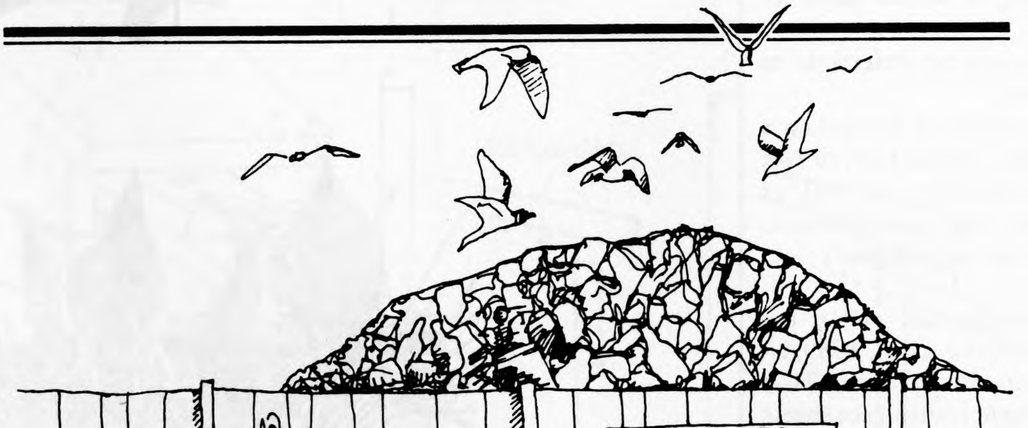
The larger of the two, the Tunxis Region, centers around towns associated with the Bristol Energy Recovery Facility; these include Berlin, Bristol, Burlington, New Britain, Plainville, Plymouth, Prospect, Southington, Warren, Washington, and Wolcott, for a total population of 250,000. According to the $60,000 contract, the region itself will analyze the waste stream and decide whether or not an Intermediate Processing Center (IPC) will be needed. The Tunxis Region will also evaluate the need for landfills, composting, transfer stations, and private facilities for collecting and marketing recyclables not handled by an IPC.

Nine municipalities with a total population of 54,000 people make up the Connecticut River Estuary Regional Planning Agency. These include Chester, Clinton, Deep River, Essex, Killingworth, Lyme, Old Lyme, Old Saybrook, and Westbrook. These towns have passed a resolution to be part of the Southeast Recycling Region and are already using an IPC in Groton for bottles and cans.

Both contracts require the regions to conduct public education programs and to submit detailed budget statements.

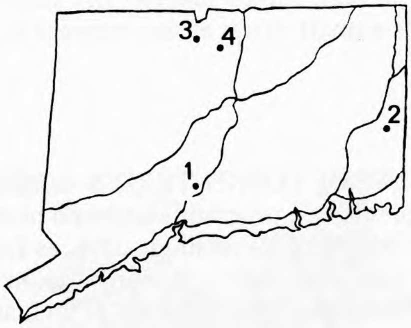
Although the contracts were finalized only last month, both regions have already begun recycling efforts. Under state law, in less than one year, nine kinds of recyclable items will no longer be accepted at landfills and incinerators. It is estimated that recycling these nine kinds of items will reduce the state's waste volume by at least 25 percent.

Items that must be recycled by January 1, 1991 include glass food containers, metal food containers, newspaper, corrugated paper, white office paper, scrap metal, automotive batteries, used crankcase oil, and leaves. ■



Our Dwindling Sand Barrens

Article prepared by
Connecticut Natural Heritage Program
Illustrations by
Megan Rollins
and
Ann Pesiri Swanson



Places to visit: Wharton Brook State Park in Wallingford (1) *and Hopeville Pond State Park in Griswold* (2) *both have excellent examples of pitch pine and oak sand barrens. The McLean Game Refuge in Simsbury* (3) *and Northwest Park in Windsor* (4) *both contain sand barrens habitat and are open to the public.*

A SMALL STAND OF PITCH PINES near Bradley International Airport, an open field of little bluestem grass sandwiched between industrial parks in North Haven, a stand of mixed oaks and pines in Pachaug State Forest; sand barrens are widely distributed but increasingly rare in Connecticut.

Pitch pine (*Pinus rigida*), Connecticut's only three-needle pine, thrives in the dry, sandy soil of most sand barrens.

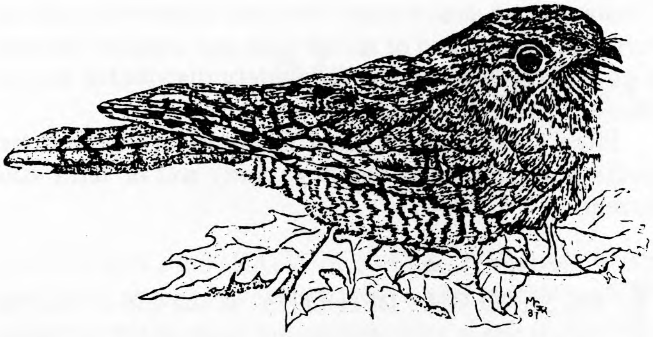
THE SAND WAS DEPOSITED at the end of the last ice age about 15,000 years ago, principally by waters running off from the great glacier that was just then receding from Connecticut. Turbulent meltwater streams carried bits of sand and small pebbles and cobbles along in their flow. Where the streams ran into the quiet waters of lakes and ponds, the sand and gravel would fall to the bottom, no longer suspended by the mad rush of the stream. Large deposits built up over the centuries. The glacial lakes are gone now, but the sandy deltas, fans, and terraces remain as the substrate for Connecticut's sand barrens.

PURE OR ALMOST PURE SAND does not make fertile soil. Sand has many fewer nutrients for plants to use than clay or loam soils. Moreover, sand retains very little water. Rain trickles right down between the sand particles, and little remains trapped near the surface for plants to use. Thus, sand barrens do not support the lush vegetation found in areas with moist, fertile soils. To make conditions even worse for many plants, the dryness of sand barren soils results in a high frequency of forest fires. As a result, some common species will not grow in sand barrens at all. Other plants, though, have adapted to the special conditions of sand barrens, including fire, and thrive best here.

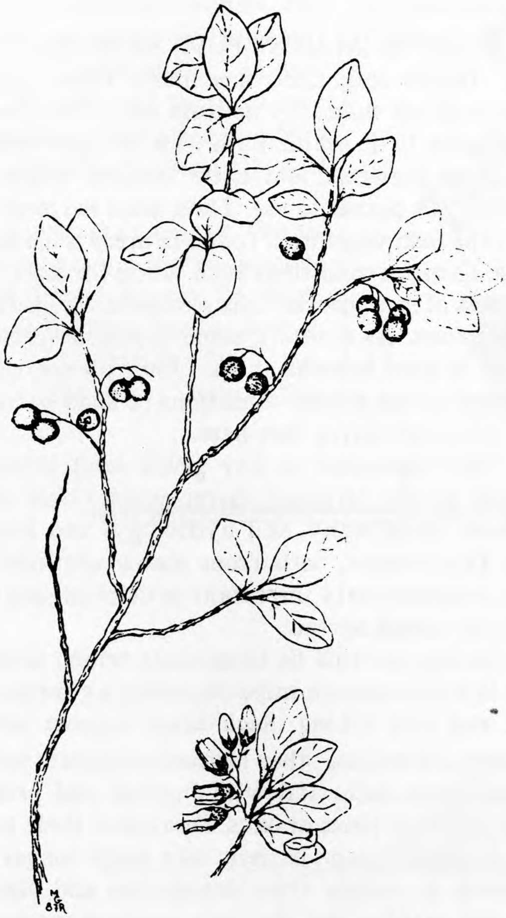
The vegetation in any given sand barren is determined by the physical characteristics (soil composition, climate, topography, and hydrology) and history of the site. Disturbance, both from man's activities and from fire, is particularly important in determining the appearance of a sand barren.

At one extreme lie those areas which have been subject to severe human impacts, including farming, quarrying, and dirt biking. Such areas support lichens, some grasses and sedges, other herbaceous plants such as milkweeds, blue curls, and wild lupines, and perhaps a few stunted pitch pines or oaks. Because of their harsh growing conditions, sand barrens take much longer than other habitats to recover from denudation and disturbance of the soil surface, and the open, treeless character of sand barrens may persist for decades.

At the other extreme are those areas which have escaped all disturbance, including fire, for many years. Here, oaks are the dominant species, mixed with pitch and white pines, black birches, black cherries, and red maples.



Whip-poor-wills (Caprimulgus vociferus) *blend into the forest floor with their mottled brown coloring. Their camouflage provides necessary protection for these secretive ground-nesting birds.*



Black huckleberry (Gaylussacia baccata) *grows abundantly in the dry soils and light shade of sand barren habitats. The bluish-black berries provide food for many birds and small mammals.*

The trees are usually smaller than average and species such as sugar maples, beeches, white ashes, tulip poplars, and dogwoods generally do not grow in the dry, acidic soil.

Between the open barren and the mixed forest, sand barrens support many gradations of vegetation associations. In all of them, pitch pines, oaks, grasses, blueberries, and huckleberries predominate. The ground cover is typically sparse, with club mosses, spotted wintergreen, and in early summer the bright pink lady's slipper scattered over the forest floor. Periodic fires keep out competing deciduous trees and allow the pitch pines and shrubs room to regenerate and grow.

Black huckleberry (*Gaylussacia baccata*) grows abundantly in the dry soils and light shade of sand barren habitats. The bluish-black berries provide food for many birds and small mammals.

THE SANDY SOIL and special vegetation of sand barrens provide habitat for many animals. Mammals, from tiny shrews and voles to deer and foxes, feed and shelter in sand barrens. Rufous-sided towhees, white-breasted nuthatches, and many other bird species can be seen in the oak and pine forests, and birds such as whip-poor-wills and pine warblers show a strong preference for nesting in sand barrens.

Whip-poor-wills (*Caprimulgus vociferus*) blend into the forest floor with their mottled brown coloring. Their camouflage provides necessary protection for these secretive ground-nesting birds.

Above all, it is the insects that have made sand barrens their own. Many species of moths and butterflies, including the sleepy dusky wing, pine devil, and buck moth, feed exclusively on sand barren plants and are not found in other habitats. Tiger beetles, burrowing wolf spiders, and velvet ants require the sandy soil of sand barrens to live in, and large ant mounds are a striking feature of some sand barren communities.

The burrowing wolf spider (*Geolycosa turricola*) is found only in sand barren habitats in Connecticut. This spider builds a small turret at the entrance to its vertical burrow.

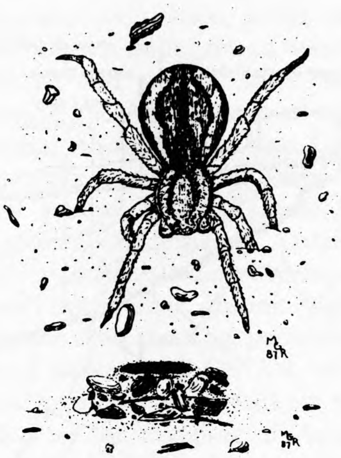
BECAUSE OF CONNECTICUT'S successful forest fire prevention program, shrub and pitch pine sand barrens are becoming increasingly rare, as fire-sensitive hardwoods take over more and more sites. In most cases, fire prevention is good for the forest, as well as for public safety. In some instances, though, occasional controlled fires actually benefit important plants and animals. In addition, small controlled fires may reduce the likelihood of a severe fire, thus improving public safety.

Sand barrens are an example of a habitat type that requires and thrives on periodic fires. With their various adaptations the oaks, pitch pines, shrubs, and grasses of sand barrens quickly put out new growth following a fire. One day the woods are black and bare, on the next new pine needles and young grass spears glow green against the charred forest. Within a few months, only the black fire scars on the trunks of the trees show that the area burned.

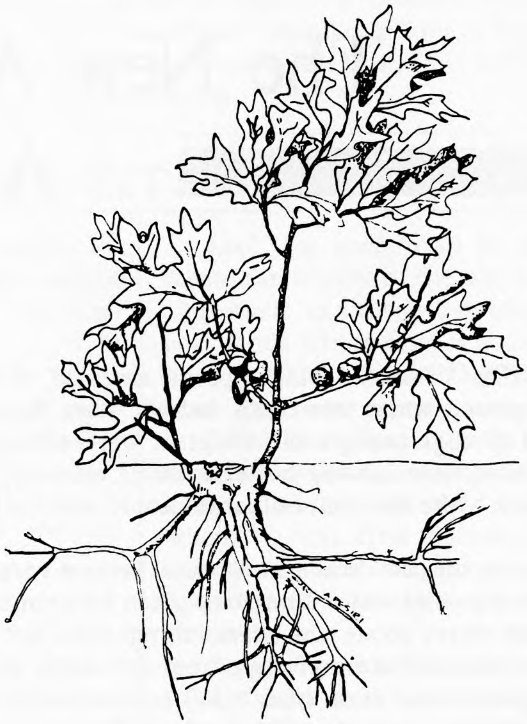
The bear oak (*Quercus ilicifolia*) shows one strategy for surviving forest fire. Even if the above-ground part of the tree is killed, the plant has enough energy stored in its roots to quickly sprout back.

At the same time that they were deprived of fire, sand barrens have been subjected to many kinds of development. Flat, well-drained, free of rocks, and close to major cities, they make perfect building sites for homes, businesses, and factories. They are quarried for sand and used as cemeteries, dirt biking terrain, and dumps. Once there were thousands of acres of sand barrens in central Connecticut; today all but a few hundred acres have been built over, quarried out, or dumped on. Only a few sites still offer a home to buck moths and the low rockrose, and even the hardy pitch pine is seen less often than it once was.

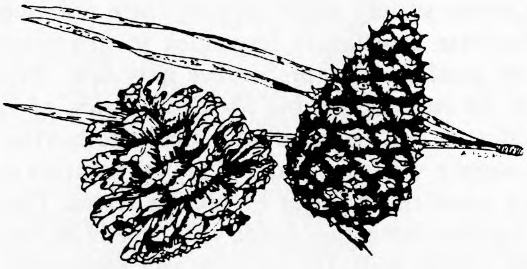
FORTUNATELY, SAND BARRENS are finally gaining some recognition. Two small sand barrens have been designated as state natural area preserves, and others are located in town parks and private preserves. One of the most difficult problems in preserving sand barren habitat is the management of fire. As people gain a better understanding of sand barrens ecology, preserve managers are becoming more open to allowing this natural, indeed necessary, force a role in the land under their care. Thus, with public concern, protection, study, and proper management, this critical habitat type will continue to add to the richness of Connecticut's natural heritage.



The burrowing wolf spider (Geolycosa turricola) *is found only in sand barren habitats in Connecticut. This spider builds a small turret at the entrance to its vertical burrow.*

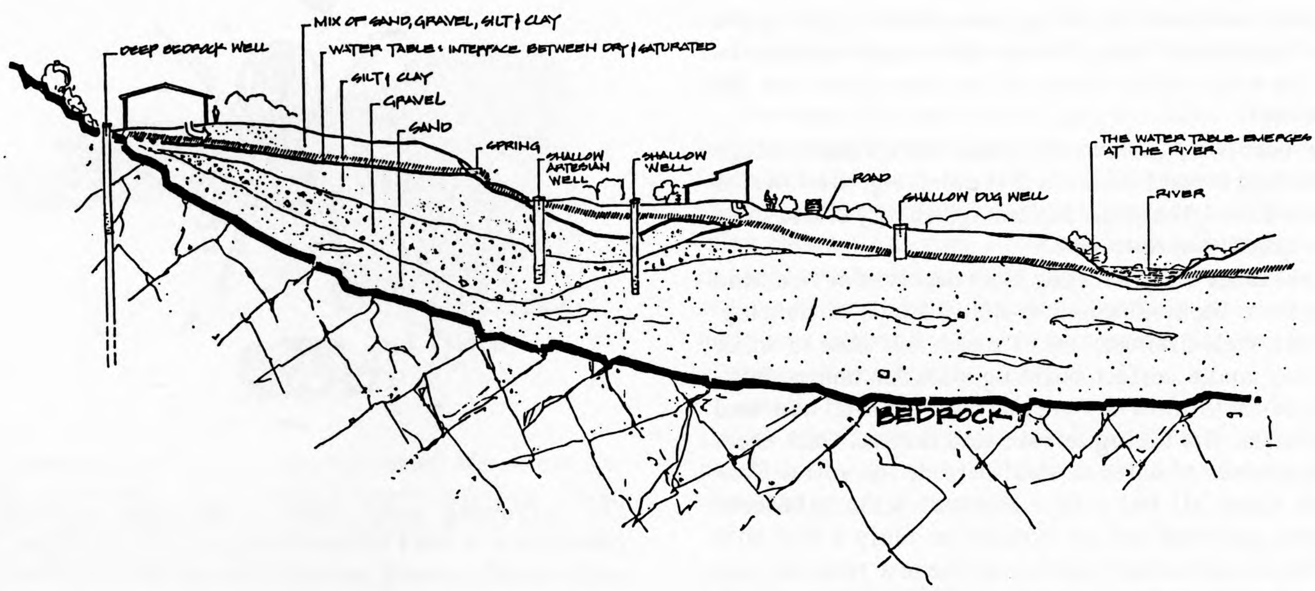


This bear oak (Quercus ilicifolia) *shows one strategy for surviving forest fire. Even if the above-ground part of the tree is killed, the plant has enough energy stored in its roots to quickly sprout back.*



Pitch pine (Pinus rigida), *Connecticut's only three-needle pine, thrives in the dry, sandy soil of most sand barrens.*

For more information on sand barrens and other critical habitats in Connecticut, please call (203) 556-3540 or write to: Connecticut Geological and Natural History, DEP, Room 553, 165 Capitol Avenue, Hartford 06106. ■


DEEP BEDROCK WELL
MIX OF SAND, GRAVEL, SILT & CLAY
WATER TABLE: INTERFACE BETWEEN DRY & SATURATED
SILT & CLAY
GRAVEL
SAND
SPRING
SHALLOW ARTESIAN WELL
SHALLOW WELL
ROAD
SHALLOW DUG WELL
THE WATER TABLE EMERGES AT THE RIVER
RIVER
BEDROCK

During the past decade, it has become clear that clean ground water is not to be taken for granted. (Illustration from Franklin County Planning Division, Conroy, Massachusetts.)

The New Aquifer Protection Area Act

by

Diane Mayerfeld

ONCE UPON A TIME, people assumed that all ground water was clean. Indeed, when naturally filtered through enough soil, water in wells and springs is free of disease-causing bacteria. Until recently, these pathogens were the contaminants people worried most about.

During the past decade, however, it became very clear that clean ground water is not to be taken for granted and one must worry about many more things than just making sure the well is far enough from any septic system. During this time, more than 1,300 contaminated wells have been documented in Connecticut. This contamination was the result of landfills, use and storage of gasoline and fuel oil, industrial and commercial cleaning solvents, pesticides, salt, and other contaminants. Rough estimates suggest that these wells provided drinking water to more than 150,000 people. New instances of ground water contamination are discovered weekly.

AS A RESULT OF GROWING CONCERN for ground water quality, the DEP embarked in the late 1970s and 1980s on improving ground water quality management in Connecticut. Working with the Legislature, the DEP initiated programs to better protect clean ground water resources and to provide more rapid response to contamination incidents. However, during this time it was also understood that municipalities, because of their land use regulation responsibilities, needed to be more involved in ground water protection. Connecticut's most prolific aquifers, the sand and gravel deposits referred to as stratified drift aquifers, are highly susceptible to contamination from surrounding land use. The DEP's programs were not able to ensure the long-term protection of public water supply wells tapping these resources.

The state Legislature responded to this situation in 1989 by passing a comprehensive new law. Public Act 89-305, *An Act Concerning the Designation of Aquifer Protection Areas*, requires municipalities having public water supply wells in sand and gravel aquifers to create overlay zones for Aquifer Protection Areas. The size of these Aquifer Protection Areas will depend on the pumping rate of the well, the geology and hydrology of the area, and will be determined by thorough analyses and mapping by water utilities operating the wells.

In Connecticut, there are approximately 240 well fields for which Aquifer Protection Areas can be established. However, the Act assigns priority to the delineation of Aquifer Protection Areas for those well fields operated by water utilities serving more than 1,000 people. Approximately 150 well fields, located in more than 75 municipalities, are scheduled for new protection efforts under the authority of this Act. Mechanisms also exist to delineate Aquifer Protection Areas for proposed well fields that are identified by the Water Utility Planning process. DEP is also able to identify future well fields in stratified drift aquifers having statewide significance.

Within each Aquifer Protection Area, the municipality will regulate certain land uses and prohibit others in order to guard the water of the well from accidental contamination. The Act requires the DEP to develop Aquifer Protection Area regulations for delineation of these areas, to identify which land uses and land use practices are compatible within these areas, to determine how municipalities will be required to administer land use decisions in an Aquifer Protection Overlay Zone, and to identify appropriate agricultural best-management practices.

WHILE THE CREATION of Aquifer Protection Areas is the heart of the new law, the Act also calls for many other measures to protect ground water supplies, including land acquisition, public education, incentive programs for innovative ground water pollution prevention measures, and ground water monitoring. The ambitious scope of the Act is the result of two years of work by a special Aquifer Protection Task Force which included legislators, environmentalists, representatives from industry groups, town officials, representatives from state agencies, and citizens. Although there was some dispute over details, all these diverse interests agreed on the need to ensure clean ground water supplies by preventing, rather than treating, pollution.

The various elements of the Act will take time to implement, and many measures will not really come into practice until after the mapping of Aquifer Protection Areas is completed in 1995. Also, as the report of the Aquifer Protection Task Force clearly states, more work remains to be done for public wells in bedrock. With the passage of this Act, Connecticut has taken a very important step toward protecting the purity of its drinking water for present and future generations.

For further information on the Aquifer Protection Program or for a copy of the *Aquifer Protection Task Force Report*, contact the Water Compliance Unit at 566-7049, or write to the Water Compliance Unit, DEP, 165 Capitol Avenue, Hartford 06106. ■

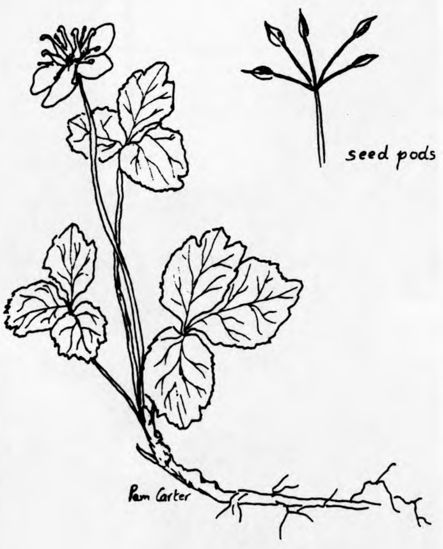
Trailside Botanizer

Goldthread

by
Gale W. Carter
Illustration by
Pam Carter

Goldthread (*Coptis groenlandica*), or canker-root, is a small, delicate creeping plant that may grow to a height of three to six inches. It is one of a relatively small number of low growing plants that persist through the winter months in the northeast. Its most noticeable characteristics are its golden, many-branched underground stem (rhizome) and its three shiny evergreen leaflets with their sharp-toothed edges.

Each plant has several stalks that usually produce a single flower but occasionally there may be two flowers per stalk. The flowers are white with three to seven sepals which are petal-like. These are shed early. The petals are absent or represented by small, slender, and club-shaped structures that act as nectaries for visiting insects. There are 15 to 25 white stamens each with yellow anthers. The number of slender pistils vary from three to nine. Blossoming time for goldthread is from May through August. The fruit is a pod (follicle) that opens along the side. Each pod contains from four to eight seeds.



Look for goldthread in habitats where the acidity of the soil is rather high, such as in bogs, swamps, and woodlands where moss is abundant.

The genus name *Coptis* comes from the Greek *coptein* meaning "to cut." This is a reference to its divided leaves. *Groenlandica*, the species name, means "of Greenland," the place where it was first discovered and named. The common name "goldthread" describes its underground stem.

Roots of goldthread contain the alkaloid berberine which acts as a mild sedative. This quality made the plant useful at one time in treating mouth sores, such as fever blisers in children; hence the common name canker-root. Indians and early settlers obtained relief from mouth ailments by chewing on the root, while a tea made from the plant relieved eye irritations.

Goldthread roots also produce a yellow dye that the Indians used to color the feathers and porcupine quills in their headdresses. ■

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More on Recycling

RECYCLING PROGRAMS in 20 towns in Connecticut's Central Naugatuck Valley got a boost with the official signing of a contract for up to $60,000 in grant funds from the Connecticut DEP.

The Council of Governments of the Central Naugatuck Valley will plan a comprehensive regional recycling program which will help an estimated 370,000 Connecticut citizens meet the requirements of the state's Mandatory Recycling Act.

The council represents the towns of Beacon Falls, Bethel, Bethlehem, Bridgewater, Brookfield, Danbury, Middlebury, Naugatuck, New Fairfield, New Milford, Newtown, Oxford, Redding, Ridgefield, Sherman, Southbury, Thomaston, Waterbury, Watertown, and Woodbury.

"This is an important moment for Connecticut's recycling movement," said DEP Commissioner Leslie Carothers. "It adds one tenth of our state's population to the large numbers of citizens already recycling all over Connecticut."

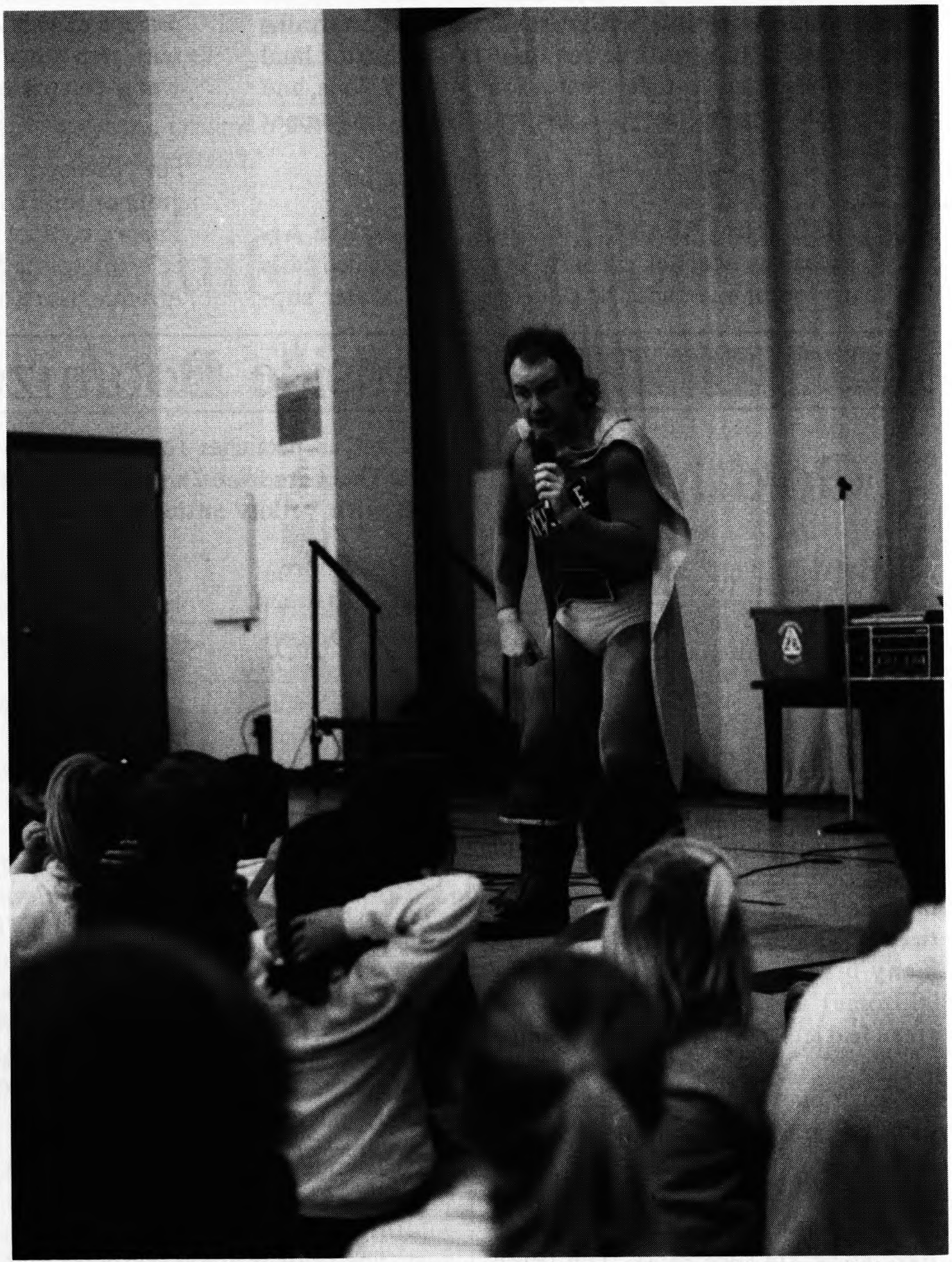
The $60,000 contract provides for analysis of the waste stream and determination of the need for municipal equipment and facilities, including landfills, composting facilities, transfer stations, and private facilities for collecting and marketing recyclables.

The contract also calls for preparation of a design for one or more intermediate processing centers, estimates of capital and operating costs for such facilities, management and/or ownership options, and a request for proposal to solicit and identify potential vendors and operators. The contractor will also identify one or more preferred sites for the IPC and develop a recordkeeping and evalution plan and a detailed public education plan.

Under state law, in less than one year nine kinds of recyclable items will no longer be accepted at landfills and incinerators. It is estimated that recycling these kinds of items will reduce the state's waste volume by at least 25 percent.

Items that must be recycled by January 1, 1991 include glass food containers, metal food containers, newspaper, corrugated paper, white office paper, scrap metal, automotive batteries, used crankcase oil and leaves.

RAY CYCLE provides an interactive, educational assembly program on recycling to elementary school children. Using a combination of music, songs, and audience interaction, Ray Cycle tells the children of his birth in a garbage dump and his "mission" to educate the public about recycling. The program is 45 minutes long, and audiences of 100 or more are requested. If you would like to reserve a date for a Ray Cycle presentation, please call Arlene Cyr at the Recycling Office in Hartford: 566-8722. ■



Ray Cycle, AKA Chris Rowlands, is the DEP's superhero. He is available to do programs on the importance of recycling.

Rivers Survey

The current demand for use of Connecticut's rivers is unprecedented in the state's history. Our rivers and streams support public water supply, recreation, waste assimilation, power generation, agriculture, transportation, fisheries, wildlife and plant habitat, and a variety of other uses. These uses are increasingly in conflict with each other. The challenge facing Connecticut is to balance the competing and conflicting demands made upon our river resources.

The Department of Environmental Protection is in the process of developing a river management program to address this challenge and implement a priority issue of Connecticut's Environmental Plan Environment/2000 (see Connecticut Environment, June 1989). As part of this effort, the Department is conducting a statewide assessment in cooperation with the National Park Service to compile information about the state's rivers as a basis for improved management decisions. The assessment is an intensive effort to gather information about resource categories, as listed below, related to rivers.

In an assessment as large as this one, we need your help to insure that we do not overlook any important river areas, uses and values. Please take a moment to complete the following questions, attaching additional information, if necessary, and return by March 15, 1990:

Rivers Program
DEP-Natural Resources Center
165 Capitol Avenue, Room 553
Hartford, CT 06106

Please indicate which activities you or your organization are involved in and which Connecticut rivers you use.

Describe your frequency of use.

Please tell us a little about your favorite river or rivers. Use a separate sheet for each river.

River Name:

Segment (indicate town location and any major landmark nearby)

from:

to:

Circle any uses and values which you feel are especially important for this river.

- fisheries and wildlife
- critical natural resources
- scenic resources
- historic and archeologic resources
- public water supply
- power generation
- industrial, commercial and agricultural use
- waste assimilation
- transportation
- land use
- recreational use
- other

Please identify any documents, persons or organizations that you know of that have additional information about the river or any of the resources listed above:

Describe activities or conditions that are detrimental to the river or adjacent lands, in your opinion.

Are you aware of any competing or conflicting uses or interests?

How effective have the existing local regulations (wetlands, zoning) been in helping to assure the protection of this resource?

What actions could be taken to better manage and protect this area?

Any other comments?

May we put you on our mailing list to receive further information about the Rivers Program? If yes, please provide your name and address below:

Name:

Address:

Great Mountain Forest near Norfolk, Connecticut, is a "working" forest where visitors may watch loggers, planers, and sawmill workers convert "the murmuring pines and the hemlocks" into finished lumber. (*DEP file photo*)

What's All the Fuss About Trees?

by

Fred Borman III

Urban Forester

PICTURE YOURSELF IN A PLACE where 75 percent of the land is in improved pasture or tilled for agriculture, where most of the trees are in the cities or in hedgerows between fields. Are we in Kansas, Dorothy? No, we are in Connecticut, circa 1850. Even as late as 1904, almost 50 percent of Connecticut's land base was used for agriculture.

So, where did all the trees come from? Connecticut is in the favorable position of being in the transition zone between the central upland hardwoods featuring red, black, and white oaks, and hickory, and the northern hardwoods of beech, birch, and maple. Throw in species such as white pine and hemlock and you end up with a very diverse forest cover type. As the farms were abandoned during and after the Civil War, a strange thing happened. Trees started to grow in the empty fields. First, species such as red cedar, aspen, and gray birch invaded the fields, succeeded by species like American chestnut and red and white oaks on the best sites, and white pine and scarlet oak on the drier, sandy soils. At one time chestnut was the most prominent tree on Connecticut's landscape. In the early part of the 20th century, white and red pine were planted on thousands of acres of abandoned farm land.

CONNECTICUT, in 1901, was one of the first states to appoint a state forester. The Connecticut Forest and Park Association was founded in Simsbury in 1895 to develop public appreciation of the value of forests, to establish state parks and forests and the introduction of forest management in these lands, and to encourage the study of forestry in schools. The first state nursery was established in 1905 to provide seedling stock to reforest Connecticut.

The 20th century has not been very kind to Connecticut's trees. In the early 1900s, American chestnut was all but eliminated by the chestnut blight, so that now only sprouts exist in our woodlands. Dutch elm disease caused the deaths of thousands of stately elms, leaving our city streets bare. This disease continues to be a problem to this day. We all know what the introduction of the gypsy moth has done to our trees. Even weather and insects have been a bane to our forests. In 1936, just over two percent of our forest trees were more than 60 years of age, just approaching the minimum size to be classified as sawtimber. The hurricane of 1938 blew down over 100 million board feet of timber in Connecticut's woodlands, leaving our forests a vast wasteland. A federal government forest inventory in 1985 estimated that there are now over seven billion board feet of sawtimber in Connecticut. Imagine what our landscape would look like if Hurricane Hugo had hit us instead of South Carolina. Forest fires in 1915 burned over 103,000 acres of forestland, the largest number of acres burned in recorded history in the state.

TODAY WE HAVE NEW PROBLEMS to deal with. Our red pine are destined to go the way of the chestnuts due to a scale insect. Hemlock is in danger from a woolly adelgid. This could have even more serious repercussions because hemlock is found on some of the more severe slopes along our waterways, and the roots prevent soil movement. If the trees die, erosion is inevitable. Other species, such as white ash and sugar maple, suffer from ozone, air pollution, acid rain and road salt.

What does the future hold for our trees? In 1985 Connecticut was 59 percent forested. Over 1.8 million acres are covered by trees. However, development is eating away 3,000 acres a year of our forests. In Colonial days, when trees were cut to convert land for agricultural purposes, the trees grew back when the farms were abandoned. Today, when a tree is cut to build a house or a new shopping mall, no new tree will grow to take its place. Government statistics show that by the year 2000, Connecticut should be a completely urban/suburban state. What about the trees? Our forests continue to age. The oaks which were saplings when the chestnut died are 80-100 years old. They are rapidly approaching maturity. Thousands of oaks died after the gypsy moth defoliations of the early '70s and '80s. In most places, black birch and red maple constitute the understory in our oak stands. Oak is a species that does very poorly reproducing under itself unless there is abundant sunlight and a mineral seed bed for the acorns to take root.

In our cities, only one tree is planted for every four trees removed. Some towns budget only $1.00 per capita for tree care. Only two cities spend more that $2.00 per capita on tree care. Maintenance usually consists of removing trees after a complaint. Very little pruning and fertilization are done. Tree crews and tree wardens are untrained in tree care and are not given enough money in their budgets. Our trees are growing old.

What can we do to help our trees? What we shouldn't do is think that we can "preserve" every tree in Connecticut. Nature would not allow that to happen; forests are forever changing. Also, development is inevitable. We all use wood and wood products. The American Forest Council has been quoted as saying that "every American uses the equivalent of one 18-inch diameter, 100-foot-tall tree every year." That's over 200 million trees a year. Connecticut must do its part to provide the basic wood requirements to keep the economy healthy.

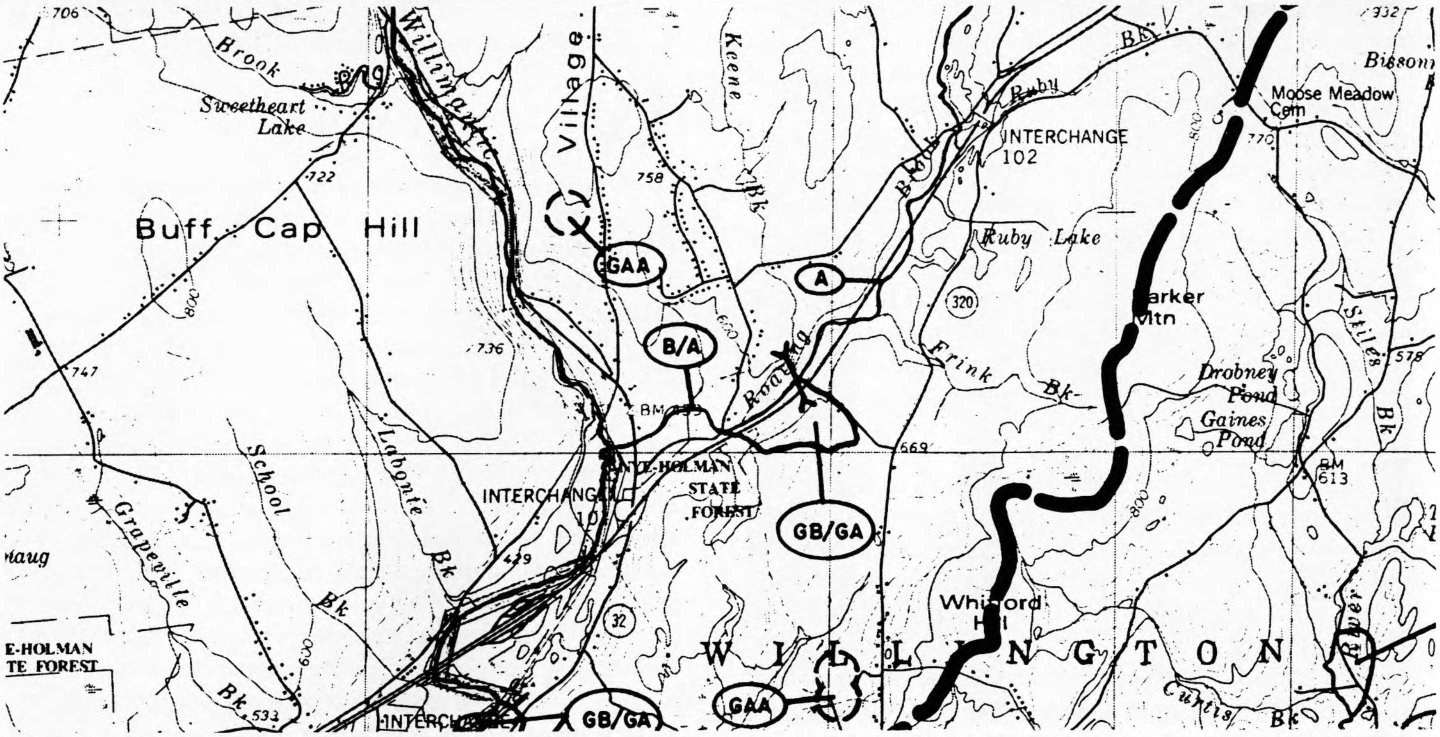
WHAT SHOULD WE DO? If you live in the city, find out how your town manages its urban trees. Does it inventory the trees to determine basic information such as species composition and maintenance needs? Does it have a program of pruning and fertilization to keep the trees healthy? Does your town have an ordinance which calls for the protection of trees during new home construction or for the planting of one or two trees for every tree removed? How much money does your town spend on tree care? In our rural areas we must manage our trees not just for their timber value but for the health of the forest, the perpetuation of desirable species, the habitats of our indigenous wildlife species as well as migratory species and for the aesthetic qualities they provide. New housing developments should be planned to include green spaces and undeveloped areas in which the trees remain.

Next time you take a hike in one of Connecticut's forests, stop, look, listen, and think about the forest. Look not only at the magnificent oaks and tulip poplar, the stately sugar maples and white pine towering overhead, but look at the understory vegetation as well. What is there? What will our children's forest look like, for this is the next generation of forest? If you come across a harvested stand, try to understand what the forester is trying to accomplish. Don't just look at the stumps and slash. Look instead at the quality trees which were left to grow for the future or to provide seed for the next generation of forest. Try to find the oak, tulip poplar or sugar maple seedling which was released from competition with the overstory and will now have a chance to develop into a healthy, growing tree.

TREES WILL GROW IN CONNECTICUT. They have for centuries. How, where, and what species will grow is becoming more dependent on the human factor. We will leave a legacy of trees for our children. In what condition will we leave the trees? That's what all the fuss is about. ■

The next time you take a hike, think about the forest and what it means to the total environment. (DEP file photo)

Map of the Month



The water quality classification letters are always encircled by a solid line. The dashed circle indicates a public water supply well. A "G" preceding the letter refers to the groundwater quality. A slash "/" between two symbols refers to current quality first and the future goal quality second. The "dog bone" across the river indicates a divide between two water qualities.

New Perspectives on the Water Quality Map

by
Alan Levere
Senior Environmental Analyst

I ONCE HEARD that you should read *Don Quixote* three times in your life: once in your youth, once in mid-life, and once in old age. The point, presumably, is that each time you would read a different story from your new perspective.

I have tried to parallel that with work that I do here at the DEP but, no matter how many different times in your life you look at a topographic map, you probably won't change your perspective on it a whole lot.

While that may be so for topos, I do know it is not true for every map. I now hold *The State Water Quality Classifications Map* in a completely different perspective from when I first saw it. I no longer see the lines, colors, and symbols as I did. I now see the game plan that reveals the future of Connecticut's water quality.

THE WATER QUALITY of the state is broken down into 10 different classifications. The classifications apply to surface, ground, and salt water qualities. Each one of these has a variety of designated uses.

The water classifications range from Class AA to A, B, C, and D. Class AA is the best and is described in part as: existing or proposed drinking water supply, wildlife habitat, public recreational use, and possibly some restricted recreational use. Class D is described, in part, as "possibly having severe sediment contamination, presence of chemical contaminants, and may preclude use for swimming during summer."

As you move away from Class AA, the water quality degrades both physically and chemically. That means Class D water might have more heavy metals in greater quantities -- iron, magnesium, lead, chromium, etc. -- than Class AA. Class D water will not look very appetizing, and the chances are good it will have an offensive odor.

When you see the map, a variety of colors stands out. That's because the various grades of water quality have corresponding colors, and the more degraded the water, the darker the color on the map.

The map divides Connecticut into

81 regional drainage basins/watersheds (described in the October 1989 issue of *Connecticut Environment*). Each is named and numbered for easy reference. Thus, you are able to follow pollutants as they flow to the stream's mouth and degrade the water they flow into.

The color blue dominates many of the large basins or watersheds. These are Public Water Supply Watersheds and you will note that they are now, or are planned to be, upgraded to all AA -- as you might expect a water supply to be. Reading into that, though, it follows that some land uses known to pollute will be prohibited in those areas.

After a long look at the map, you begin to realize there are many incidences where water has been polluted, downgraded, dumped into, overloaded with silt, and spilled into beyond the point of safe dilution. On the negative side, this has been going on for years. But, on the positive side, the greatest part of it is controllable, reversible, and restorable. And that is exactly what this map is all about.

And so as the book is supposed to change, so this map has changed for me over time. I was only able to fully understand this map with use. And the more I looked, the more I came to realize the weight of the statement this map was making. This map tells the story of Connecticut's water quality.

THE WATER QUALITY MAP measures about 44 by 55 inches in size. It is intended to be a planning tool. It is in full color and is at a scale of 1:125,000. The cost is $10.00 per copy.

In addition, there is an eight-sheet, 1:50,000 series of blue print maps that cover the state. These are updated every three years and are the ones to be reviewed for the most current information. The set of eight is available for $20.00.

With either set of the water quality maps, a booklet entitled "Water Quality Standards" is included. This goes into more detail than the maps do in areas such as introduction to the specific standards for surface and ground water discharges, and the criteria and parameters for each class that include: dissolved oxygen, sediment deposits, coliform bacteria, pH, taste, odor, temperature, and chemical constituents.

Please include $2.00 for shipping and handling and eight percent Connecticut sales tax. Our address is: DEP-NRC, Map Sales, Rm. 555, 165 Capitol Avenue, Hartford, CT 06106. ■

The Night Sky

The Wandering Twins

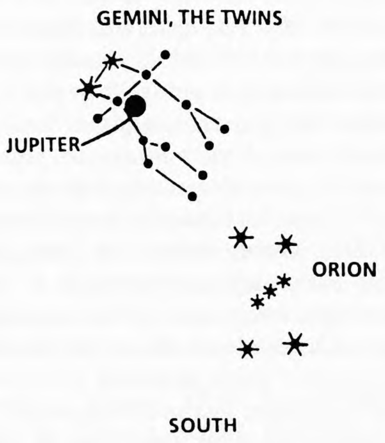
by

Francine Jackson

THERE IS A WANDERER within one of the season's most recognized constellations: Gemini, the Twins. In the center of the picture lies a star-like object brighter than anything else around it. In fact, even if you weren't aware of the location of Gemini in the sky, the presence of this beacon would be enough to light your way to the Twins. The intruder? The planet Jupiter, the solar system's largest and the third brightest object in the night sky. Only the moon and the planet Venus shine brighter than Jupiter, but Venus can never be overhead, as Jupiter is this month.

Jupiter, named after the king of the gods, is eleven times the diameter of the earth. To put this in perspective, about 1,200 earths, or all the other planets within our solar system, could fit into a hollowed-out Jupiter. Despite its large size, though, Jupiter has the fastest rotation of all the planets; One "day" on Jupiter equals just under 10 of our hours. It rotates so fast that its cloud cover appears to move like crazy to keep up with the planet. We see the clouds as bands strung almost like ribbons across Jupiter's face.

With just a small telescope, you may be able to notice what amateur and professional astronomers have been watching the past few months. Up until recently, Jupiter was seen to have two distinct dark cloud bands, one in the north (the North Equatorial Band or NEB) and one in the south (the SEB). As Jupiter became a nighttime object several months ago, viewers were shocked to find that the SEB had virtually vanished. No longer was the planet relatively symmetrical, but it now appears as if the remaining NEB is undergoing major changes. Superimposed on the NEB are spots and streaks of cloud formations, at present being called disturbances, although typically on Jupiter a "disturbance" has been defined as dark material seen over a lighter belt of clouds. What is causing these occurrences is still a mystery. Will the SEB return? Will there be more disturbances in the NEB? Will there be other odd events anywhere on the giant planet's face? Are the changes caused by a sudden appearence of obelisks in the sky, as author Arthur C. Clarke so vividly described? If you have access to a telescope, keep watching; there appears to be more to Jupiter than meets the unaided eye. ■



Environmental TV Series

Environment is a series of 30-minute videotapes, produced by Sandra Sprague and hosted by Bob Paier. In this series, environmental topics which pertain to Connecticut are covered. Guests include scientists, public officials, environmental activists, and concerned citizens. The program is shot both on-location and in the studio, using the facilities of WPL-TV in Wallingford. To date, the series has been shown on numerous public access channels in Connecticut, and at special events. A number of private citizens have purchased the tapes for their own personal use.

The following is a listing of programs which have already been produced:

"Wintering Eagles": Rita Duclos, a wildlife biologist with the DEP, discusses Connecticut's unique population of wintering bald eagles. Duclos describes some of the biology of this magnificent animal, its feeding, reproduction, and migration patterns, as well as as its status as a protected species. Location footage of bald eagles feeding and flying at Shepaug Dam Observation Area is included.

"Between Two Cultures": Indian Affairs Coordinator Ed Sarabia discusses the complex political realities that face contemporary Native Americans, and particularly the five tribes in Connecticut. Issues of determining tribal status, laws which pertain on Indian reservations, and abrogation — the breaking of old treaties — are discussed. Sarabia outlines the structure and function of the Connecticut Indian Affairs Council.

"A Living Tradition": Second of two programs with Indian Affairs Coordinator Ed Sarabia. Sarabia talks about the healing nature of Indian "medicine," the training of the medicine man, and how Indian religious practicies were suppressed for many years. Location footage of a sweat lodge. Program concludes with discussion of alcoholism, suicide, and the current rediscovery of Indian identity.

"Animal Relocation": Guest is wildlife rehabilitator Skip Hilliker, with some 90 raccoons, two foxes, five fawns, and assorted creatures. Hilliker explains his methods of caring for and eventually releasing animals back to the wild. Entire program is at the Hilliker home in East Hampton. Two raccoons are released.

"The Long Island Soundkeeper": Guest is Terry Backer, who has lived his whole life on the Sound, has been a commercial fisherman, and is now the eyes, ears, and conscience of Long Island Sound. Backer describes some of the threats to the biological health of the Sound, how critical the marshlands are, and describes the disruption of the balance of nature in the Sound. Program is shot in Norwalk Harbor and on outlying islands.

"Urban Forestry": Guest is Extension Forester Jeffrey Campbell. Campbell describes how important a healthy urban forest is to the community, and how correct management is necessary to bring that about. Campbell draws on his experiences in India to describe the global aspects of forestry, and how destruction of the forest may affect the health of the planet.

"Connecticut Recycles": Guest is Recycling Coordinator Kim Marcy. Marcy describes the state mandate to recycle 25 percent of the solid waste stream by 1991, how towns and regions are responding to this mandate, and what the individual should know before recycling is actually in place. A number of pointers are given to help citizens minimize volume of waste, and to avoid over-packaged products.

"Inland Wetlands": Doug Cooper, of DEP's Water Recources Unit, explains the value of wetlands in the hydrologic cycle, and how necessary they are to the land, the wildlife, and to humans. Cooper describes how wetlands have been lost to development in the past, and how their use is now closely regulated and controlled by local communities. Location footage of a wetland in Wallingford.

"Hazardous Waste Collection Days": Leslie Lewis of the DEP explains how the municipal hazardous waste collection day is handled. More than just a public relations tool, this program both encourages public participation and does make a dent in the waste stream. Lewis lists a number of hazardous materials found in most homes, and discusses how their improper disposal could cause environmental problems. Location footage of a collection day in Southington.

"Ground Water Protection": Principal Environmental Analyst Jim Murphy explains in basic terms the hydrologic cycle and how clean ground water is essential in Connecticut. Murphy explains such terms as aquifer and watershed, and describes his role in going to individual towns to explain how they can understand their own environmental and hydrologic requirements. Location footage is of the ground water exhibit at the Connecticut State Museum of Natural History at Storrs.

"Partnership with the Land": Jim Murphy discusses his understanding of the "big picture," the totality of the environmental system, and how man is an integral part of that. Murphy talks about the importance of getting reconnected to the land to regain a sense of responsibility and stewardship. Murphy talks about the character of the Indians' relationship to the land and quotes from Aldo Leopold.

"Low Level Radiation Disposal": Guest is Kathleen Golas of the Connecticut Hazardous Waste Management Service. Golas describes her role is determining the site of a low level radioactive waste disposal facility in Connecticut. She describes the criteria for picking such a site, the nature of radioactivty and radioactive waste, and the response of the citizens of Connecticut to this situation.

"Renewable Energy": Guest is State Representative Joel Gordes. Gordes describes our over-dependence on oil, how this will lead both to shortages and pollution. He talks about the problems of nuclear energy. He talks about the practical and economical uses of renewable energy sources, such as solar, wind, water, and geothermal, and makes suggestions for those who wish to get more active in addressing the energy problem in Connecticut.

"The Spirit of the Wolf": Doug Radjewicz, of the Northeast Audubon Center in Sharon, introduces Rasta and Wolfie, two timber wolves confiscated by the DEP. Radjewicz describes the incredible strength and intelligence of the wolf, and its history of persecution by man. Having been involved with these two wolves for almost two years, Radjewicz has developed an uncanny sensitivity and respect for them. He discusses the future of the wolf in the United States.

"Giving Back to the Wildlife": Rita Duclos, wildlife biologist, talks about how habitat loss has affected wildlife and what individual homeowners can do to help. Duclos talks about landscaping a backyard to proide food and cover for animals. She also talks about birdfeeders, types of seed, and species of birds that can be attracted to everyone's backyard.

To find out how this series can be broadcast in your area, or if you are interested in obtaining copies of any of the programs, please phone Sandra Sprague at WPL-TV (Wallingford Public Library) – (203) 265-6754. ■

Four-Town Land Trust

The Four-Town Land Trust has been created to preserve natural resources in the towns of East Windsor, Ellington, Enfield, and Somers.

The types of land it seeks to preserve include: prime agricultural land; wetland and wildlife areas; Scantic and Connecticut river watershed areas; significant historical, archaeological, and geological sites; and key areas of scenic beauty.

The land trust can acquire and manage such lands outside of local governmental or political channels. This land trust ensures that these resources will be protected and cared for, thus enhancing the quality of life in these towns for generations to come.

Preservation of agricultural land is a prime objective of the Four Town Land Trust. The Connecticut River Valley encompasses some of the best agricultural land in the world. Through creative and aggressive acquisition and management the land trust can ensure the continuation of agriculture. The land trust can act as intermediary, thus making agricultural land available at agricultural values.

For further information, contact: George Grant, President, Four Town Land Trust, Inc., Melrose, CT 06049: or phone (203) 627-8062. ■

Hazardous Waste Violations

The DEP has referred two firms which transport hazardous waste to the Office of Attorney General Clarine Nardi Riddle in response to violations of Connecticut's Hazardous Waste Management Regulations and the Connecticut General Statutes. DEP Commissioner Leslie Carothers announced the action by the Enforcement and Engineering Division of DEP's Bureau of Waste Management.

"About 300 shipments of federally- and Connecticut-regulated hazardous materials travel around and through this state each day, so this is an area of considerable concern to us," Carothers said. "These referrals are part of a growing department-wide emphasis on vigorous enforcement of environmental laws and regulations."

Facility Name: EEX Incorporated, 2301 E. Francis Street, Ontario, CA 91761.
Violation: EEX transported large quantitites of hazardous waste (flammable solid N.O.S., UN 1325, known as Alumina Zeolite Hydrocracking Catalysts) in or through the state of Connecticut without a Connecticut DEP hazardous waste transporter's permit. The regulations state that "a person shall not transport hazardous waste in or through the state of Connecticut without having received a permit from the commissioner."

Facility: L.P.M. Corporation, 1770 Kings Highway, Fairfield, CT 06430.
Violation: L.P.M. has transported hazardous wastes that were not listed on their permit and transported hazardous waste using vehicles not listed on their permit. ■

Endnote

"To understand the Universe, it is not necessary to leave the house."

Lao-Tzu

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